

REMARKS

In the Official Action, the Examiner rejected claim 4 under the second paragraph of 35 U.S.C. §112 for failing to define the relative temperature under which the intrinsic viscosity is determined. The Examiner then rejected all of claims 1-10 based on provisional "obviousness-type" double patenting over claims 1-8 of copending Application No. 11/918,443. The Examiner finally raised a number of prior art rejections as set forth on pages 4-8 of the Action.

In response to the points raised in the Official Action, claim 1 has been canceled without prejudice or disclaimer, claim 2 has been amended to define one aspect of the present invention with greater precision consistent with the specification, such as in the passage beginning at page 13, line 17, and claims 4-9 have been amended to accommodate the cancellation of claim 1.

Applicant respectfully submits that the claims now of record are patentable in all regards particularly in view of the following discussion and the technical evidence which has been made of record. Addressing the points in the Official Action in the order in which they have been raised, applicant first notes that claim 4, like all claims, cannot be read in a vacuum, but must always be considered in light of the specification, see *Orthokinetics, Inc. v. Safety Travel Chairs, Inc.*, 1 USPQ2d 1081 (Fed. Cir. 1986). In the present situation, the specification in the passage bridging pages 19 and 20 provides not only the temperature at which the intrinsic viscosity is determined, but the technique used to determine the intrinsic viscosity of the Examples and Comparative Examples. Thus, when claim 4 is read in light of the specification, those of ordinary skill in the art will have no difficulty in ascertaining the temperature at which the intrinsic viscosity is to be determined.

Turning to the provisional "obviousness-type" double patenting rejection, applicant respectfully points out that claim 1 has been cancelled without prejudice or disclaimer and claim 2 now recites the presence of both an ultraviolet absorber (D) and a hindered amine compound (E) with both of these components having a heating mass reduction ratio of 50%

by mass or less when held at 340°C for ten minutes under a nitrogen atmosphere. The significance of this recitation will be discussed below, but it is evident that the claims of Application Serial No. 11/918,443 do not include these features and applicant therefore respectfully maintains that the claims of the instant application, which was filed prior to the filing of the '443 application, are separately patentable and therefore cannot be the subject of a double patenting rejection.

Before addressing the prior art rejections set forth in the Action, applicant believes that it is worthwhile to discuss the present invention and the advantages which may be obtained therefrom. As recited in amended claim 2, one aspect of the present invention provides a polyamide resin composition which comprises 30 to 80 percent by mass of a defined polyamide resin (A) 10 to 60 percent by mass of an inorganic filler (B), and 5 to 50 percent by mass of a white pigment (C), wherein the composition further comprises an ultraviolet absorber (D) and a hindered amine compound (E), both of the ultraviolet absorber (D) and the hindered amine compound (E) having a heating mass reduction ratio of 50 percent by mass or less when held at 340°C for 10 minutes under a nitrogen atmosphere.

The effect of the recited combination of the ultraviolet absorber (D) and the hindered amine compound (E), both having the defined heating mass reduction ratio of 50 percent by mass or less is shown in the illustrative and comparative Examples provided in the specification, the results of which are summarized in Table 1 on pages 27-28. If one considers Examples 3-5, one can understand that the combination of the defined ultraviolet absorber and hindered amine compound can provide excellent characteristics, including reflection retention. When such results are contrasted with Comparative Example 4, which includes an ultraviolet absorber (D2) that does not meet the recited heating mass reduction ratio or Comparative Example 5 which does not include the defined ultraviolet absorber, but includes an increased amount of the hindered amine compound (D3), the reflection retention is substantially lower. In this regard, Example 3 and Comparative Example 4 are identical

formulations with the exception that Comparative Example 4 includes the different ultraviolet absorber (D2).

With a foregoing background in mind, applicant respectfully maintains that the prior art of record does not anticipate or render obvious the presently claimed invention. Oka et al., U.S. Patent Application Publication No. 2004/0034152, describes a polyamide composition comprising 100 parts by weight of (A) a defined polyamide and 5 to 100 parts by weight of (B) a titanium oxide with an average particle size of 0.1 to 0.5 μm . Paragraph [0033] states that the polyamide composition can further contain (C) at least one reinforcing agent and paragraphs [0038-40] describe the possible presence of a light stabilizer (D) which can include UV absorbing compounds and hindered amine compounds, as well as other materials such as hindered phenol compounds. The Examples of Oka et al. describe the presence of Nylostab S-EED and Sanduvor VSU as light stabilizers in paragraphs [0077] and [0078], respectively. Both of these light stabilizers are used in the illustrative compositions set forth in Table 1.

The polyamide of Oka et al. is substantially different from the polyamide composition defined in the claims of record. The document does not in any way lead those of ordinary skill in the art to the defined polyamide composition with the recited combination of an ultraviolet absorber (D) and a hindered amine compound (E), both having a heating mass reduction ratio of 50% by mass or less when held at 340°C for ten minutes under a nitrogen atmosphere. Indeed, Oka et al. does not in any way recognize that this heating mass reduction ratio has any effect on the composition and certainly does not recognize that there are certain ultraviolet absorbers and hindered amine compounds which have this heating mass reduction ratio and certain compounds which do not. To provide further insight into this issue and to show that the illustrative compounds disclosed in Oka et al. do not inherently meet the claimed ultraviolet absorber and hindered amine compound, provided herewith is a Declaration Under 37 C.F.R. § 1.132 by the inventor which tests each of the described specifically identified materials in Oka et al. and determines that Nylostab S-EED

has a heating mass reduction ratio of about 60% by mass and Sanduvor VSU has a heating mass reduction ratio of about 100%.¹ Thus, it can be understood from this information that Oka et al. does not anticipate or suggest the invention as defined in the claims of record and does not recognize the advantage in reflection retention that can be obtained in accordance with the present invention. Accordingly, applicant respectfully maintains that the claims are clearly patentable over this document.

JP 2000-204244 (which also identifies Mr. Oka as a co-inventor) is even further removed from the present invention. The publication provides a polyamide composition which contains a certain amount of inorganic filler having an average particle size of 2 μm or below. In paragraph [0022], the publication only mentions an ultraviolet ray absorbent and does not even mention a hindered amine compound. In this latter respect, it will again be noted that the U.S. Oka et al. in paragraph [0039] separately mentions hindered amine compounds and hindered phenol compounds. The JP publication therefore does not teach the recited combination of the ultraviolet absorber and hindered amine compound with both having a heating mass reduction ratio of 50% by mass or less as recited in claim 2 and does not recognize the significance of these compounds so as to obtain the advantageous characteristics illustrated in Table 1 of the present application.

JP 07-228776 similarly falls far short from being sufficient to justify a rejection of the claims whether considered alone or in combination with any of the other cited prior art. The description in paragraph [0023] only peripherally mentions an ultraviolet ray absorbent and again does not mention a hindered amine compound. Moreover, the publication is totally silent with respect to the heating mass reduction ratio of 50% by mass or less as recited in claim 2 and the publication does not recognize the advantages which can be obtained therefrom. Thus, both of the Japanese publications are even further removed from the present invention than Oka et al. and any possible hypothetical combination of the

¹ It appears that the chemical names of the respective compounds have been reversed as may be seen from the chemicals formulas in the enclosed excerpts from the technical literature by Clariant KK, the source of the compounds.

documents would not lead in any way to the presently claimed invention or to a recognition of the advantageous results which can be obtained therefrom. Accordingly, based on the claims and technical evidence now of record, applicant respectfully maintains that the claims are patentable in all regards and therefore requests reconsideration and allowance of the present application.

As a final matter, it is noted that subsequent to the mailing of the Official Action, a Third Information Disclosure Statement was filed on January 30, 2009, and applicant respectfully requests consideration of the information and return of the acknowledged citation form.

Should the Examiner wish to discuss any aspect of the present application, he is invited to contact the undersigned attorney at the number provided below.

Respectfully submitted,

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れ、それを図 5 に示しました。テトラメチルピペリジン環に発生した安定なニトロキシラジカルが、活性なポリマーラジカルと結合し、不活性化します。それが他で発生したポリマーラジカルを捕捉し、ラジカル同士を結合して、自身は元の安定なニトロキシラジカルに戻ります。これを繰り返すことにより、プラスチックを劣化から防止します。

HALS は、テトラメチルピペリジンを機能基として構造に含んでいます。すべての HALS が、同一の機能基を含んでいるにもかかわらず、効果には差異があります。それは、いわゆる HALS の“二次構造”、化学的に活性をもたなくてピペリジン環に結合している部分に関連しています。この“二次構造”は、HALS の重要な適合パラメーター、特に相溶性と移行性を決定します。

2-2-2 紫外線吸収剤およびヒンダードアミン系光安定剤の製品概要

Ultraviolet
Absorber

◆ 紫外線吸収剤

現在、プラスチックにはベンゾトリアゾール系、ベンゾフェノン系、あるいはトリアジン系の紫外線吸収剤が、主に使用されていますが、当社の製品群にはこれらと異なった化学構造を有した紫外線吸収剤がラインアップされています。サンデュボア VSU は蔞酸アニリド系の紫外線吸収剤で、ホスタ

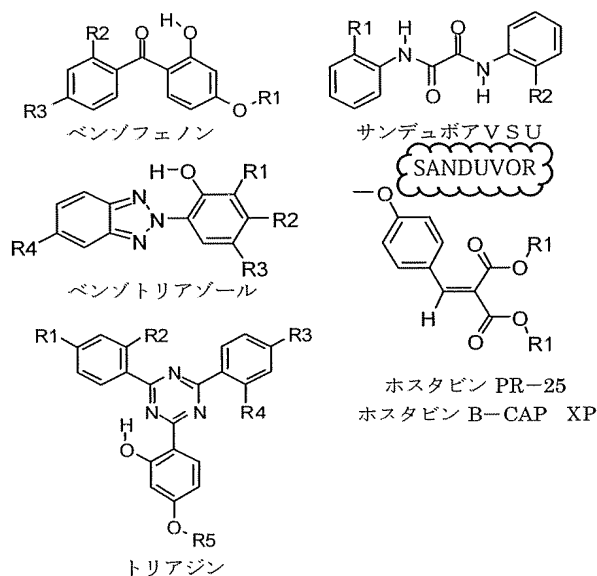


図 6 紫外線吸収剤の化学構造

ビン PR-25 およびホスタビン B-CAP XP はマロン酸エステル系の紫外線吸収剤です。(図 6 参照)

図 7 に、それらの紫外線吸収剤の吸収スペクトルを示しました。ベンゾトリアゾール系、ベンゾフェノン系、あるいはトリアジン系の紫外線吸収剤は、ベンゼン環のオルソ位がヒドロキシ基で置換されているため、300nm 付近の低波長部以外に、可視光領域に近接した 350nm 付近の長波長部にも吸収ピークがあり、二つの極大吸収ピークを示します。したがって、プラスチックに黄味の初期着色を与えます。一方、サンデュボア VSU、ホスタビン PR-25 およびホスタビン B-CAP XP は、可視光領域に近接した 350nm 付近の長波長部に吸収ピークを持たないため、プラスチックに初期着色を与えません。

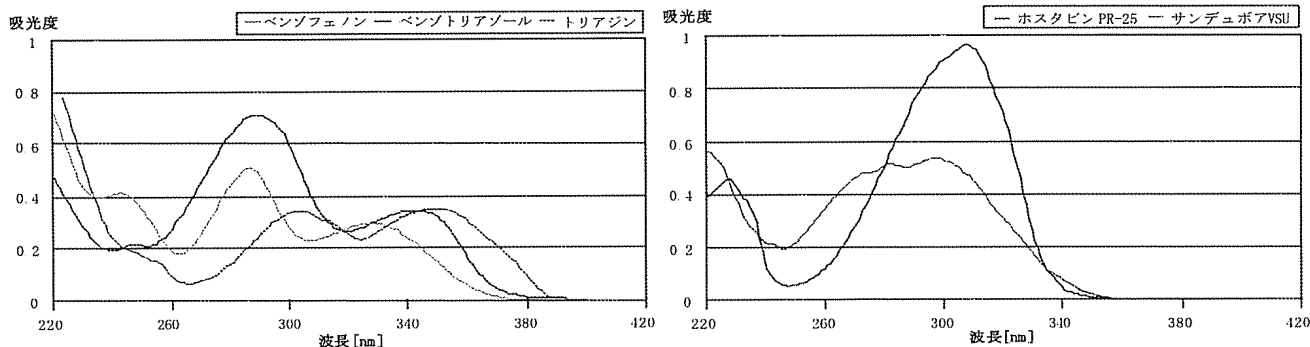


図 7 紫外線吸収剤の吸収カーブ (溶剤：シクロヘキサン、測定濃度：10mg/l)

また、サンデュボア VSU、ホスタビン PR-25 およびホスタビン B-CAP XP のもう一つの特徴として、金属イオンに起因する黄変が起きません。図 8 は、ジクロロメタンに溶解した紫外線吸収剤溶液に、4 価のチタンイオンを添加した試験結果を示しました。添加後、サンデュボア VSU およびホスタビン PR-25 は、黄変を起こしませんが、ベンゾトリアゾール系、ベンゾフェノン系、あるいはトリアジン系の紫外線吸収剤は、黄変や黄色の沈殿を生じます。

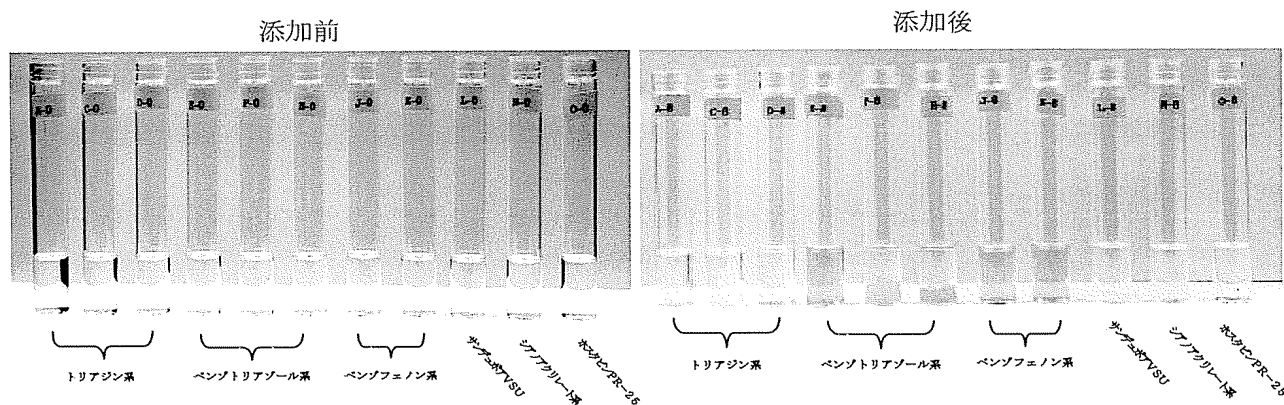


図 8 金属イオンが紫外線吸収剤の黄変に及ぼす影響
(紫外線吸収剤を 500ppm 溶解したジクロロメタンに 100ppm4 価のチタンイオンを添加した結果)

Hindered
Amine
Light
Stabilizer

◆ ヒンダードアミン系光安定剤 (HALS)

ナイロスタブ S-EED は、図 9 に示すような HALS 構造を持った、今までにない多機能性を持ったポリアミド樹脂用添加剤で、一分子中に数々の有益な特性を備えています。ナイロスタブ S-EED は、その特異な分子構造のため、ポリアミド樹脂の熔融状態における還元性に耐え、熔融樹脂の安定剤あるいは熔融工程改質剤として効果を発揮します。この効果は、ポリアミド樹脂の良質な射出成型品や押出し成型品の製造を可能にするばかりでなく、繊維の紡糸工程におけるフィラメントの糸切れの減少に寄与します。また、アミノ基の導入によって、染色性も向上します。

図 9 ナイロスタブ S-EED の化学構造

NYROSTAB

ナイロスタブ S-EED の特徴は、次のようになります

- ポリアミド樹脂との優れた相溶性
- ポリアミド樹脂の押出し加工性の向上
- 長期耐熱性および光安定性の向上
- 染色性の向上

2-3 難燃剤

プラスチックの難燃性に関する規制は、欧米と日本を中心に、多くの産業分野で施行されています。それによれば、難燃規格は、電気・電子材料、車両用材料（自動車、鉄道車両）、船舶用材料、航空機用材料、建築用材料、家具調度品など広範囲にわたっています。これらの難燃規格のうち、難燃材料の開発に多大な影響を与えたのが電気・電子分野の規制であるアメリカの UL 規格にあることは、衆

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